Tagging activities of olive ridley turtle at Gadongalay and Gayetgyi Islands, Bogalay Township in Ayeyarwady division, Myanmar

AUTHOR(S):

LWIN, MAUNG MAUNG

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MAUNG MAUNG LWIN
Senior Fisheries Officer
Environment and Endangered Aquatic Animals Conservation Unit
Department of Fisheries, Myanmar
E-mail : fisheries@myanmar.com.mm, akthar10160@gmail.com

ABSTRACT
The population of sea turtle is distinctly decreasing year after year due to poaching, incidental catch by fishing gear, degradation of feeding grounds and nesting beaches. Myanmar started systematic conservation and management activities of sea turtle around 1997. In 2001, applicators and Inconel Tags were provided by SEAFDEC-MFRDMD so that research on sea turtles could be carried out using tagging technology. The tagging can yield valuable insight into migrations and the locations of foraging areas. Olive ridley turtle *(Lepidochelys olivacea*) is known to nest and forage in Myanmar. Inconel tagging activities on olive ridley turtle (*Lepidochelys olivacea*) were conducted at Gadongalay (Kadonlay) and Gayetgyi Islands. The nesting turtle population was recorded from 2001 to 2007. A total of 74 turtles at Gadongalay and 102 turtles at Gayetgyi island were tagged. Twelve tagged turtles at Gadongalay and 17 tagged turtles at Gayetgyi were recovered during the study period. Among 12 tagged turtles recovered, 10 turtles laid their eggs in Gadongalay Island. In Gayetgyi Island, 15 turtles of 17 recovered tagged turtles laid their eggs.

KEYWORDS: olive ridley turtle (*Lepidochelys olivacea*), inconel tagging (flipper tagging), Gadongalay and Gayetgyi Islands, nesting population, tagged turtle recovered

INTRODUCTION

Myanmar has started the systematic conservation and management activities of sea turtle since 1997. Myanmar conducted the research to conserve sea turtles and its nesting beaches and laid the rules and regulations such as Myanmar Marine Fisheries Law (1999) and Myanmar Wildlife Law (1994). Since 1999, Myanmar was declared as one of the member countries in Southeast Asian Fisheries Development Center (SEAFDEC) organization. The staff from the Department of Fisheries could participate in training organized by SEAFDEC such as Aquaculture Technology, Fishing Technology and Marine Fishery Resources Conservation, etc. Myanmar started sea turtle conservation activities in 1986, but systematic conservation and management activities could be carried out around 1997.

Tagging is most often conducted to obtain information on reproductive biology, movements, stranding, residency and growth rates. Historically, tagging has been the single-most valuable activity in advancing our understanding of sea turtles and their conservation needs in relation to complex life cycles, reproductive migrations, slow growth rates (for some species), and delayed sexual maturation. In many cases, a commitment to years of systematic tagging may be necessary to achieve certain objectives. However, in some instances the tagging of even a few turtles, particularly at nesting beaches where tagging has never been conducted, can yield valuable insight into migrations and the locations of resident foraging areas. Sea turtles were tagged during the nesting period of consecutive years and monitoring was also made to record the landing frequencies of individual sea turtles recovered.

MATERIALS AND METHODS

Inconel tagging activities on olive ridley turtle (*Lepidochelys olivacea*) was conducted at Gadongalay and Gayetgyi Islands, Bogalay Township, Ayeyarwaddy Division, Myanmar. Recovered tagged turtles were observed and noted. The rate of nesting and number of eggs laid were also recorded. Turtles were monitored during the nesting seasons.

The Gadongalay Island (15º 41’ 28.5” N 95º 14’ 47.3” E) has existed since 1911. This Island is formed with deposited sand at the mouth of Bogalay River , Ayeyarwady delta is located at the Bay of Bengal and close to the Andaman Sea. Gadongalay Island is five miles in length from east to north-west and three miles in breath with cross bow shape facing to the sea.

Gayetgyi Island (15º 41’ 07” N 95º 16’ 20” E) has also existed since 1911.This Island is formed with deposited sand at the mouth of Bogalay River. Gayetgyi Island is five miles in length and half mile in breath. Gadongalay Island and Kaing Thaung

Island are the most popular nesting beaches where human settlement began during 1972 - 1980, and both islands are now occupied by local populace. About 80 turtle nests were found annually on Gayetgyi Island in the past 10 years but 47 nests were reported in Gayetgyi Island in 2003. 200-250 families also inhabit the small
island particularly at the eastern part of Gadongalay Island.

Fig. 1 Map Showing Studied Areas

According to the local villagers, the number of sea turtle that nest on the beaches is rapidly declining. In 1985 egg collectors could harvest more than a hundred nests per night during the nesting season in Gadongalay Island.

Though over 60 to 80 nests could be harvested per night during the nesting season in Gadongalay Island in 1985, only 45 nests can be harvested in 2003.Olive ridley turtles lay their eggs on these Islands from September to March annually. Sea turtles were tagged during the nesting period of the consecutive years and monitoring was also made to record the frequencies of individual sea turtles recovered.

Applicators and Inconel Tags were provided by MFRDMD under SEAFDEC so that research on sea turtles could be carried out using tagging technology. The applicators and Inconel Tags (National Band and Tag Co., USA) received by MFRDMD were sent to Bogalay and Ngaputaw townships. In the Sea Turtle Conservation Areas in Ayeyarwaddy Division, tagging activity was carried out during the nesting seasons of sea turtles starting from 23 December 2001.

Inconel tags with series number MM-0000 were used for this study. Two Inconel tags were used and fixed to each turtle on both flippers (left and right flipper). Two Departmental staff and two volunteers took part in this project.

In Myanmar, Turtle Conservation and Management Training Courses were conducted in which theory and practical application of tagging activities were included. In 2004, the Department of Fisheries distributed a Tag Wanted Flyer in Myanmar language. The Department of Fisheries has already received 200 numbers of Tag wanted posters from SEAFDEC-MFRDMD in October 2006 which were distributed at National Workshop on Marine Turtle Conservation and Management (In commemoration of Year of Turtle – 2006).

RESULTS

A total of 289 and 286 nesting frequencies were recorded at Gadongalay and Gayetgyi Islands during the period from 2001 to 2007 respectively (Table 1).

Table 1 Nesting turtle populations recorded at the studied islands

Year	Gadongalay Island	Gayetgyi Island
2001	12	9
2002	86	67
2003	60	34
2004	46	43
2005	29	45
2006	42	45
2007	14	43
Total	289	286

In Gadongalay Island, 74 olive ridley turtles were tagged utilizing Inconel tags during the study period from 2001 to February 2007 (Table.2). 102 number of olive ridley turtles were tagged utilizing Inconel tags during the mentioned period in Gayetgyi Island (Table.2)

Table 2 Tagged olive ridley turtles released at Gadongalay and Gayetgyi Islands

Year	Tagged Turtle No. (Gadongalay)	Tagged Turtle No. (Gayetgyi)
2001	4	7
2002	26	15
2003	8	13
2004	15	18
2005	4	20
2006	12	14
2007	5	15
Total	74	102

Recovered tagged turtles of the two islands and related tag numbers are shown in Table 3 and 4. In Gadongalay Island, out of 74 turtles tagged from 23rd December 2001 to 10th February 2007, 12 turtles (16.216%) returned to the island where only 10 turtles were recorded as nesting turtles. In Gayetgyi Island, out of 102 turtles tagged from 23rd December 2001 to 23rd 2007, 17 turtles (16.66%) returned to the island where only 15 turtles were recorded as nesting turtles. Among 12 tagged turtles recovered, 10 turtles laid their eggs in Gadongalay Island. In Gayetgyi Island, 15 turtles of 17 recovered tagged turtles laid their eggs.

Signal of an olive ridley turtle fitted with Platform Terminal Transmitter (PTTs) was lost on 14th January2007.

Table 3 Number of tagged turtles recovered at Gadongalay island and related tag numbers (MM)

Tag Number(MM)	2001	2002	2003	2004	2005	2006	2007	Total
0026/0027	1 (Landed at Gayetgyi)	1						2
0028/0029			1					1
0131/0132				1 (Landed at Gayetgyi)				1
0153/0154				1 (Landed at Gayetgyi)				1
0175/0176				1				1
0177/0178				1				1
0167/0168				1	1	1		3
0181/0182				1				1
0187/0188				1				1
Total	1	1	1	7	1	1	-	12

Table 4 Number of tagged turtles recovered at Gayetgyi island and related tag numbers (MM)

Tag Number(MM)	2001	2002	2003	2004	2005	2006	2007	Total
0008/0009	1							1
0014/0015			1					2
0016/0017		1						1
0042/0			1					1
0046/0047			1					1
0056/0057			1					1
0050/0051			1					1
0070/0071				1				1
0084/0085				1				1
0092/0093				1				1
0096/0097				1				2
0205/0206						1		1
0215/0216					1			1
0231/0232					1			1
0239/0240						1 (Landed at Gadongalay)		1
0507/0508						1		1
0283/0284						1		1
Total	1	1	5	4	2	4		17

DISCUSSION

Olive ridley turtles are found foraging near the studied islands where the experiments are being conducted. It can be positively assumed that there is a favorable habitat around those Islands.

The Department of Fisheries could not tag all the nesting turtles. Only 25.60% and 35.03% of the nesting turtles could be tagged at Gadongalay and Gayetgyi Islands respectively because of the insufficient human resources for night patrolling, and both Islands are in large size.

16.216 % and 16.66 % of tagged turtles were recovered at Gadongalay and Gayetgyi Islands respectively. It is considered that monitoring measure should be further strengthened. The tagged turtles might also migrate to other remote areas or killed by fishing activities.

The incidental capture of sea turtles in fishing gears is a very serious threat to sea turtles and is blamed for major population decline. Shrimp trawlers have been singled out as major threat to sea turtles (Chark, 2003).

Nesting turtles usually return to the same beach or island to lay several clutches within one nesting season (Limpus, 1993). After two to eight years, many of these females will make another breeding migration, each generally returning to nest on the same beach as before (Limpus, 1993). Genetic and tagging studies suggest that the female returns to breed in the same region as her birth. For example, a turtle born in Terengganu should return to breed in Terengganu when it grows up, but not necessarily to the same site of the beach (Limpus, 1993).

At Makepit, only 25% of green turtles return back for nesting and took almost two years to return to the same location. At Chendor, only 21% of sea turtles remigrated to the same nesting location and mostly took a period of three years to return back for nesting (Syed et,al. 2004).

Tagging activities in Myanmar are in a very infant stage. The monitoring and study of tagged turtles lasted more than five years. The present information on the tagged turtles could not provide complete information. Research on sea turtles using tagging methodology started a few years ago and it needs time to make conclusion. Although systematic data on foraging activities of the olive ridley turtles around both islands could not be recorded, it was assumed that the turtles foraged around the islands over the seasons since the nesting olive ridley turtles were observed from September to February.

Department of Fisheries promulgated Notification 1/2004 for tag recovery and also distributed pamphlets and wall posters including tag recovery information.

Sea turtles are widely distributed in tropical and subtropical waters in the world. Recently, incidental kill of sea turtles by Tuna longline fisheries was noticed. In Myanmar, Sea Turtles were also killed by improper fisheries including longline fisheries, and an effective education programme should therefore be developed to strengthen the conservation activities. During monitoring to get the data on recovered turtles, difficulty occurred due to insufficient patrolling staff

at the conservation stations. Most of the local people who live in coastal fishing areas have no experience and poor knowledge in Sea Turtle Conservation and Protection. Thus, fishermen and local people should cooperate and participate in Sea Turtle Conservation and Protection Activities.

More complete data and the analysis of results need to be discussed in the long term. Research on the sea turtles using tagging methodology started a few years ago and it needs more time to make a conclusion from the data analyzed.

Conservation and protection of sea turtles are mainly undertaken by the Department of Fisheries in Myanmar. Parallel with the conservation programme, some research relating to the nesting ecology is conducted in the areas where the Department of Fisheries mainly focuses on sea turtle protection. Balazs(1999) said that current technology and techniques for effectively tagging of sea turtles are less than perfect.

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